

Thrasher, Sandra Jo

From: Gebhardt, Sharron
Sent: Tuesday, September 09, 2003 1:09 PM
To: Thrasher, Sandra Jo
Subject: FW: MMs Oil Valuation Proposal

Follow Up Flag: Follow up
Flag Status: Flagged

-----Original Message-----

From: Deal, David T. [mailto:ddeal@fulbright.com]
Sent: Friday, September 05, 2003 7:07 PM
To: Gibbs Tschudy, Deborah; Deal, David T.
Cc: 'leonard@api.org'; Gebhardt, Sharron
Subject: RE: MMs Oil Valuation Proposal

Debbie- Thank you.
dave

-----Original Message-----

From: Deborah.Gibbs.Tschudy@mms.gov
To: ddeal@fulbright.com
Cc: leonard@api.org; Sharron.Gebhardt@mms.gov
Sent: 9/5/2003 4:22 PM
Subject: RE: MMs Oil Valuation Proposal

Dave,

In response to your September 2, 2003, email we are putting into tonight's FedEx MMS' Economic Division's study of "several years of data" on the BBB matter alluded to in the proposal at 68 FR 50094.

We also will include this document in the rulemaking administrative record.

-----Original Message-----

From: Deal, David T. [mailto:ddeal@fulbright.com]
Sent: Tuesday, September 02, 2003 6:51 AM
To: Gibbs Tschudy, Deborah
Cc: Ken Leonard (E-mail)
Subject: MMs Oil Valuation Proposal
Importance: High

Debbie-

We're already hard at work on comments for the MMS oil proposal and shooting for delivery by Sept 19 if at all possible.

How do I get a copy of the MMS' Economic Division's study of "several years of data" on the BBB matter alluded to in the proposal at 68 FR 50094?

Dave

David T. Deal
Fulbright & Jaworski LLP
801 Pennsylvania Avenue, NW
Washington, DC 20004-2623
202-662-4633
202-662-4643 fax
ddeal@fulbright.com

Gibbs Tschudy, Deborah

From: Rose, Marshall
Sent: Wednesday, July 02, 2003 1:01 PM
To: Gibbs Tschudy, Deborah
Cc: Schantz, Radford
Subject: FW: revised cost of cap

Debbie: Attached is work I promised that we'd do for you on the cost of capital for determining transportation allowances in situations involving the non-arms length shipment of oil. Looking back, these findings are seen to be consistent (fortunately) with the earlier work I did for you over 3 years ago on a similar issue relating to gas transportation.

Regards,

Marshall Rose

9/4/2003

COST OF CAPITAL FOR PIPELINES

Summary

Assuming that pipeline businesses provide the best proxy for non-arms-length transportation of oil, two sources of data for the cost of capital are presented. Energy Department data covering oil and gas pipelines imply that the return on investment (which approximates the cost of capital) for pipelines averages roughly the same as the BBB rate. In contrast, Ibbotson data for gas pipelines and distributors imply that, for the first quarter of 2003, the cost of capital for pipelines is a multiple as low as 1.1 and as high as 1.5 of the BBB rate, depending on detailed assumptions. Using those assumptions we feel most comfortable with, the multiple we find to be appropriate for this data set is 1.3.

Background

The context of the paper is ongoing debate about an administratively simple rule for cost of capital in non-arms-length transportation of oil. While MMS has been suggesting the BBB bond rate, or possibly a multiple that is 1.3 times the BBB rate, the API argues that the cost of capital averages a larger multiple of the BBB rate, such as 1.6.

In a recent research paper, "Capital Cost of Pipeline Assets," API characterizes the relevant concept for cost of capital of a non-independent pipeline as the weighted average cost of capital (WACC), which averages the cost of equity and debt of the overall firm (regardless of specific financing arranged for the pipeline). Importantly, the "overall firm" in the API analysis is assumed to be the oil production industry. This industry comprises large integrated corporations as well as small, independent producers. Financial data and cost of capital estimates are reported by Ibbotson for the oil industry as represented by two standard industrial sectors, SIC 131 – typically smaller and nonintegrated – and SIC 291 – typically the integrated majors, plus some refiners that lack upstream affiliates. For both sectors, API computes the ratio of WACC to the BBB bond rate, finding that the multiple is about 1.8 for SIC 131 and 1.6 for SIC 291 for a recent point in time (2002 through October). They also compute the ratio for years 1997 to 2002 and show its degree of variation from year to year.

The API paper, which is based on contracted research by Ibbotson, is technically excellent as regards cost of capital to oil and gas producers. However, its relevance to the issue about valuing non-arms-length pipeline transactions is doubtful. More relevant would be estimates of the cost of capital for these companies' pipeline business. In this paper, I draw on two sources of information, EIA and Ibbotson, about the pipeline business specifically.

EIA data

EIA publishes return on investment (roi) for lines of business of its Financial Reporting System, which samples the major oil corporations. Roi is one possible indicator of cost of capital. As

seen from the table below, the roi for the pipelines business of these companies averages well below the roi on their US production business for most years and size classes. The (post tax) roi on the pipelines is 6.0% and 9.7% for the two years shown.

Furthermore, the roi of the pipelines averages about the BBB rate, which for the same two years is roughly 7% after adjusting for taxes. (Specifically, the BBB rate on pre-tax basis averaged 8.5% for 2000 and 2001. Tax adjustment is explained below.) Also, most pipelines have BBB rating for their debt capital (*NG Trends '95*).

While these EIA data might suffice to settle the main point in dispute, they are not directly comparable with Ibbotson data, being based on a different sample and different details of methodology. Thus we proceed next to consider the Ibbotson data.



Table B8. Return on Investment for Lines of Business for FRS Companies Ranked by Total Energy Assets, 2000-2001
(Percent)

Line of Business	All FRS		Top Four		Five through Twelve		All Other	
	2000	2001	2000	2001	2000	2001	2000	2001
Petroleum	13.9	12.2	16.1	12.5	10.6	11.8	11.9	12.2
U.S. Petroleum	13.2	13.1	16.7	12.7	9.6	12.7	11.7	14.5
Oil and Gas Production	17.7	13.1	20.4	12.3	18.5	14.0	11.0	13.3
Refining/Marketing	9.6	14.5	11.1	16.7	-5.5	10.9	13.4	15.1
Pipelines	6.0	9.7	7.9	8.2	5.3	11.0	7.1	25.7
Foreign Petroleum	15.1	10.9	15.6	12.3	14.4	9.0	12.3	7.7

Note: Return on investment measured as contribution to net income/net investment in place.

Source: Energy Information Administration, Form EIA-28 (Financial Reporting System).

Ibbotson

Ibbotson publishes cost of capital for gas pipelines and distributors, but not oil pipelines. To use Ibbotson data to estimate WACC for company's oil pipeline segments, we must assume that oil pipelines have about the same cost of capital as gas pipelines and distributors. Certainly we acknowledge that there are differences between gas and oil pipelines, including differences in the regulatory regimes they operate under. Nevertheless, we make the plausible assumption that the gas pipeline WACC is a measure more relevant to the present topic than the oil production WACC.

The published Ibbotson data are aggregated in a way that complicates investigating pipeline cost of capital. SIC 492 combines pipelines and local distribution companies (l.d.c.'s). Apparently the pipelines tend to have a slightly higher cost of capital (i.e., lower rating) than the l.d.c.'s. According to EIA (*NG Trends '95*), most pipelines have BBB rating, whereas most l.d.c.'s have A rating.

Ibbotson publishes data for sector 492 and for one of its subsectors, SIC 4924 (which includes the l.d.c.'s specifically). The relation of the definitions of SIC 492 and its various subsectors are shown in the Attachment on the next page. Inasmuch as Ibbotson publishes data for the l.d.c. subsector 4924, one thinks of a strategy of adjusting SIC 492 data and focusing it better on pipelines by removing the l.d.c. subsector, 4924. Unfortunately, most of the companies in Ibbotson's sample are in SIC 4924 (11 out of 12), and apparently only one is a mainly transmission company (1 out of 12). The one transmission company might or might not be representative. Because of that sample limitation, we do not try to remove SIC 4924 effects from the aggregate SIC 492. Instead, we report numbers for both sectors.

We purchased Ibbotson data for only the most recent period, namely, first quarter of 2003.

Attachment: Industry Group 492: *Gas Production And Distribution*

4922 Natural Gas Transmission

Establishments engaged in the transmission and/or storage of natural gas for sale.

- Natural gas storage
- Natural gas transmission
- Pipelines, natural gas

4923 Natural Gas Transmission and Distribution

Establishments engaged in both the transmission and distribution of natural gas for sale.

- Natural gas transmission and distribution

4924 Natural Gas Distribution

Establishments engaged in the distribution of natural gas for sale.

- Natural gas distribution

4925 Mixed, Manufactured, or Liquefied Petroleum Gas Production and/or

Establishments engaged in the manufacture and/or distribution of gas for sale, including mixtures of manufactured with natural gas.

To facilitate contrast, the tables following are number the same way as the corresponding tables in the API paper.

Capital structure

The debt share of total capital of the pipeline sector is shown in table 1.

Table 1. Debt share of capital (Median)

	SIC 492	SIC 4924
Jan-March 2003	45.40%	46.50%
5-year average	50.12%	50.03%

source: Ibbotson reports

Cost of debt

The cost of debt in these sectors varies by company. The Ibbotson data on bond rating are given in table 2. The sole non-l.d.c. company in the SIC 492 sample is apparently rated as BBB.

Table 2. Debt rating

S&P Debt rating	SIC 492 capital \$ billion	SIC 492 number of companies	SIC 4924 capital \$ billion	SIC 4924 number of companies
AAA,AA,A	\$10.5	6	\$10.5	6
BBB	\$13.7	4	\$4.4	3
BB,B,CCC,CC,D	0	0	0	0
Not rated	\$1.4	2	\$1.4	2

source: Ibbotson reports

One can infer from this table that the transmission company has a cost of debt that is BBB, and the l.d.c. companies are BBB or better. Looking at the row for BBB, SIC 492 covers 4 companies, whereas SIC 4924 covers 3 companies; thus the sole non-l.d.c. company apparently is BBB rated. This is consistent with the EIA statement that pipelines generally are rated BBB (cited above).

Marginal tax rates

Ibbotson sells marginal federal tax rate estimates for individual companies, not SIC aggregates. We have not tried to purchase data from Ibbotson regarding marginal tax rates for companies in SIC 492 or SIC 4924. Where it is necessary to apply an effective tax rate, we use a range of 15% to 35%.

Table 3. Marginal tax rate, assumed high-low range

High ... 35%

Low ... 15%

Cost of equity

There are several ways to define and to compute cost of equity capital, as explained in the Ibbotson literature. The API paper adopts the capital asset pricing model (CAPM) approach. This is as good as any for the present purpose, and we follow suit. There are two variants of this approach; the “size premium” adjustment accounts for the tendency for small companies to grow faster than textbook CAPM calculations allow for. See table 4 and footnote 1.

Table 4. Cost of equity capital (Median)

	SIC 492	SIC 4924
CAPM	5.56%	5.35%
CAPM + size premium	6.70%	6.75%

source: Ibbotson reports covering Jan-Mar 2003.

Weighted average cost of capital

Ibbotson combines cost of debt and cost of equity using its own tax adjustment to arrive at a consistent after-tax number. See table 5.

Table 5. After-tax WACC (median)

	SIC 492	SIC 4924
CAPM	6.67%	6.56%
CAPM + size premium	7.09%	7.14%

source: Ibbotson reports covering Jan-Mar 2003

Since the differences between the two columns are due to the presence of the sole non-l.d.c. company in SIC 492, one can infer something about that company’s WACC. According to the basic CAPM estimate, the larger aggregate SIC 492 has a WACC of 6.67%, which is slightly higher than the estimate for the l.d.c. subsector, namely, 6.56%. The implication is that the WACC for the sole non-l.d.c. company is pulling up the sector average, and indeed it must be greater than 6.67%. On the other hand, the CAPM + size premium estimate gives the aggregate SIC 492 WACC as 7.09%, which is lower than the estimate for the l.d.c. subsector of 7.14%. So, as regards the CAPM + size premium estimates, the sole non-l.d.c. company must be pulling the sector average down, and it must be lower than 7.09%. Being bracketed between 6.67% and 7.09%, the non-l.d.c. firm appears to have a WACC about 7%.

Pre-tax adjusted WACC

Pre-tax adjusted WACC can be computed assuming the range of tax rates 15%-30%. The purpose of the tax adjustment is to allow consistent comparison of WACC and the BBB rate. Whereas Ibbotson reports WACC on after-tax basis, the BBB rate is naturally a pre-tax number.

It doesn't matter whether one adjusts the WACC to make it pre-tax or one adjusts the bond rate to make it post-tax, so long as both terms are put on the same basis. In table 6, the adjustment is performed on the WACC. Specifically, the WACC numbers are divided by $1-t$. (To the extent that a greater proportion of costs can be expensed or depreciated more rapidly, the adjusted used overstates the resulting pre-tax rate of return.)

Table 6. Pre-tax WACC

	SIC 492, 15% tax rate case	SIC 492, 35% tax rate case	SIC 4924, 15% tax rate case	SIC 4924, 35% tax rate case
tax rate	0.15	0.35	0.15	0.35
After-tax WACC				
capm	6.67%	6.67%	6.56%	6.56%
capm +	7.09%	7.09%	7.14%	7.14%
Pre-tax adjusted WACC				
capm	7.85%	10.26%	7.72%	10.09%
capm +	8.34%	10.91%	8.40%	10.98%

source: tables 3 and 5

Observe that a sector's pre-tax adjusted WACC is greater as the tax rate is greater. Mathematically, a larger tax rate in the divisor, $1-t$, means dividing by a smaller number. Intuitively, as the tax rate is greater, the pre-tax WACC must be greater to generate the same net return in the face of taxes.

Earlier, in discussion of table 5, it was inferred that the WACC for the sole non-l.d.c. company in the Ibbotson sample must be about 7%. The conversion to a pre-tax basis can be performed on this number, too. It appears that the non-l.d.c. company's pre-tax adjusted WACC ranges from 8.2% to 10.8%.

Implied multiple of the BBB rate

The BBB bond rate for 1st quarter 2003 is shown in table 7a.

Table 7a. BBB industrial rate

Jan 2003	7.19%

Feb 2003	7.09%
March 2003	7.12%
Average	7.13%

source: *Standard & Poors Bond Guide* per MMS staff

The ratio of (per-tax adjusted) WACC to the BBB rate is calculated for high and low effective tax rate assumptions and shown in table 7b, next.

Table 7b. Ratio of WACC to BBB, for low and high tax rates

	SIC 492, 15% tax rate case	SIC 492, 35% tax rate case	SIC 4924, 15% tax rate case	SIC 4924, 35% tax rate case
BBB	7.13%	7.13%	7.13%	7.13%
Pre-tax adjusted WACC				
capm	7.85%	10.26%	7.72%	10.09%
capm +	8.34%	10.91%	8.40%	10.98%
Ratio WACC/BBB				
capm	1.10	1.44	1.08	1.42
capm +	1.17	1.53	1.18	1.54

source: tables 6 and 7a

Again, one can infer something about the sole non-l.d.c. firm in the Ibbotson sample. It was observed earlier, in connection with table 6, that non-l.d.c. company's pre-tax adjusted WACC ranges from 8.2% to 10.8%. The implication is that the ratio of WACC/BBB for this company ranges from about 1.1 to 1.5. To provide a most likely ratio using this data set, we observe that several studies have concluded that the industry marginal tax rates are in the range of 20%. OMB requires use of a 25% marginal tax rate for the industry. Applying this rate to the after-tax WACC, and recalculating the ratio, we find the most likely multiplier to be 1.3.